

THE EFFECTS OF INDOOR MOLDS AND GENETIC POLYMORPHISMS ON WHEEZING ILLNESS IN CHILDREN

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Background and Aims: Evidence has shown that climate may contribute to different prevalence of asthma in different geographic areas. In subtropical area, indoor dampness is a risk factor for respiratory symptoms and constitutes a significant public health problem. However, little is known about the effects of dampness and genetic polymorphisms on asthma. In this study, we evaluated the effects of home dampness and β 2-adrenergic receptor (ADRB2) genetic polymorphisms on asthma and wheeze.

Methods: We investigated 6078 schoolchildren by a standard questionnaire for respiratory symptoms and environmental exposures. Multiple logistic regressions were performed to assess the association between ADRB2 polymorphisms and home dampness frequency and degree (visible mold on the wall, mildewy odor, water stamp on the wall, and water damage) on asthma phenotypes, after adjusting for potential confounders.

Results: The frequency mildewy odor, the number of walls with water stamp, and the duration of water damage were associated with increased risk of awakened at night due to wheeze ($p < 0.05$). ADRB2 Arg16Gly showed significant interactive effect with home dampness on current wheeze (p for interaction = 0.04) and awakened at night due to wheeze (p for interaction = 0.007). The frequency and degree of home dampness was associated with increased risk of current asthma, current wheeze, medication use, and awakened at night in an exposure-response manner among children with ADRB2 Arg/Arg genotype ($p < 0.05$).

Conclusion: ADRB2 genetic polymorphisms may be responsible for differences in susceptibility to childhood asthma and wheeze with regard to household dampness.

Keyword: asthma, ADRB2, home dampness, gene-environmental interaction

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